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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/712,946

11/13/2003

Theodore J. Miller

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08/23/2005

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EXAMINER

HUNNINGS, TRAVIS R

ART UNIT

PAPER NUMBER

2632

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/712,946

Applicant(s)

MILLER, THEODORE J.

Examiner

Travis R. Hunnings

Art Unit

2632

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: element 29. In figure 3, element 85 is not described in the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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3. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Ramakrishnan et al. (Ramakrishnan; US Patent 6,239,677).

Regarding claim 1, Ramakrishnan discloses *Circuit Breaker Thermal Magnetic Trip Unit* that has the following claimed limitations:

The claimed separable contacts are met by the electrical contacts (column 3, lines 1-16);

The claimed operating mechanism opening the separable contacts when actuated is met by the circuit breaker operating mechanism and trip bar (column 3, lines 17-19 and 38-53);

The claimed trip unit comprising a thermal/magnetic trip device producing a thermal trip by actuating the operating mechanism in response to persistent overload conditions and producing a magnetic trip by actuating the operating mechanism in response to overcurrent conditions is met by the operation of the trip unit in response to overcurrent or overload conditions to shut off the circuit breaker through the circuit breaker operating mechanism and the trip bar (abstract and column 4, lines 22-58);

The claimed monitor providing a thermal trip indication when the separable contacts are opened by the thermal trip and providing a magnetic trip indication when the separable contacts are opened by the magnetic trip is met by the identification flags that indicate what particular trip occurred to cause the circuit breaker to trip (abstract).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramakrishnan in view of Canova et al. (Canova; US Patent Publication 2003/0202304).

Regarding claim 2, Ramakrishnan discloses the following claimed limitations:

The claimed thermal/magnetic trip device comprises a bimetal heated by current passing through the separable contacts is met by the bimetal (column 4, lines 22-58);

The claimed monitor comprising a trip sensor sensing opening of the separable contacts is met by the trip unit and link assembly that inherently sense when the contacts are open by being forced into motion through the link assembly when the contacts are opened due to the heating of the bimetal (column 4, lines 22-58).

However, Ramakrishnan does not specifically disclose the claimed temperature sensor sensing temperature of the bimetal and a processor generating a thermal trip signal in response to a sensed temperature above a selected value when the separable contacts open and output means generating the thermal trip indication in response to the thermal trip signal. Canova discloses *Electronic Circuit Breaker* that teaches using a resistor as a temperature sensor connected to a microprocessor for activating a circuit

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breaker and providing an indication that the circuit breaker was activated to a user (paragraphs 13 and 27). Modifying Ramakrishnan to utilize a temperature sensor and a microprocessor to control the operation and indication of the circuit breaker would decrease the delay inherent in the circuit breaker and make the overall device more reliable. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device disclosed by Ramakrishnan according to the teachings of Canova to use a temperature sensor sensing temperature of the bimetal and a processor generating a thermal trip signal in response to a sensed temperature above a selected value when the separable contacts open and output means generating the thermal trip indication in response to the thermal trip signal:

Regarding claim 3, the claim is interpreted and rejected as claim 2 stated above. It would have been obvious to use the microprocessor to also control the magnetic trip and indication related to the magnetic trip because the microprocessor would already be controlling the temperature control and indication.

Regarding claim 4, Ramakrishnan discloses all of the claimed limitations except for the claimed use of light emitting diodes to indicate the circuit breaker having been tripped. Canova teaches using light emitting diodes to indicate the status of the circuit breaker (paragraph 36). Changing the indicators of Ramakrishnan from flags to light emitting diodes would help the user to determine the problem with the circuit breaker in dark conditions either at night or when the power is out due to the circuit breaker having

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been tripped. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device disclosed by Ramakrishnan according to the teachings of Canova to use light emitting diodes to indicate the status of the circuit breaker.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramakrishnan in view of Canova and further in view of Durivage, III (Durivage; US Patent 5,038,246).

Regarding claim 5, Ramakrishnan and Canova disclose all of the claimed limitations except for the claimed communication means for communicating the thermal trip indication and the magnetic trip indication remotely. Durivage discloses *Fault Powered, Processor Controlled Circuit Breaker Trip System Having Reliable Tripping Operation* that teaches communication means that are used to remotely alert a user of trip indications of the circuit breaker (column 4, lines 62-68 and column 5, lines 1-15). Incorporating communication means to allow the device of Ramakrishnan and Canova to communicate remotely that a circuit breaker has been tripped would increase the flexibility of the device by allowing users to be located elsewhere from the circuit breaker and still be alerted that a trip has occurred. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device disclosed by Ramakrishnan and Canova according to the teachings of Durivage to

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include communication means to remotely communicate the status of the circuit breaker.

7. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramakrishnan in view of Kim et al. (Kim; US Patent 6,552,884).

Regarding claim 6, Ramakrishnan discloses all of the claimed limitations except for the claimed trip unit further comprising trip circuitry generating an electronic trip signal indicating at least one of an arc fault and a ground fault in the electric power distribution system and a trip actuator responsive to the electronic trip signal to actuate the operating mechanism, and wherein the monitor provides at least one of an arc fault trip indication and a ground fault trip indication in response to the electronic trip signal. Kim discloses *Circuit Breaker With Display Function* that teaches a circuit breaker with both arc fault and ground fault detection circuits that cause the circuit breaker to trip and also including indicators to indicate which particular fault occurred (column 2, lines 41-62). Adding the functionality of Kim to the device of Ramakrishnan would increase the functionality of the device by allowing it to protect from more potential faults. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device disclosed by Ramakrishnan according to the teachings of Kim to include both ground and arc fault detection and indication circuits.

Regarding claim 7, the claim is interpreted and rejected as claim 6 stated above.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramakrishnan in view of Kim and further in view of Miwa (Japanese Patent JP405300617A).

Regarding claim 8, Ramakrishnan and Kim disclose all of the claimed limitations except for the claimed monitor comprising a surge detector detecting a surge in voltage in the electric power distribution system and providing an indication of the surge. Miwa discloses *Gas Insulated Switching Apparatus* that teaches a circuit breaker having a surge sensor that detects an abnormal voltage surge and indicates that a surge was detected (purpose). Adding a surge protector to Ramakrishnan and Kim would increase the functionality of the device and allow it to protect from more faults. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device disclosed by Ramakrishnan and Kim according to the teachings of Miwa to include a surge detector and an indicator for indicating the detection of a surge.

9. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramakrishnan in view of Kim and further in view of Canova.

Regarding claim 9, the claim is interpreted and rejected as claims 2 and 3 stated above.

Regarding claim 10, the claim is interpreted and rejected as claim 4 stated above.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramakrishnan in view of Kim further in view of Canova and further in view of Durivage.

Regarding claim 11, the claim is interpreted and rejected as claim 5 stated above.

11. Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramakrishnan in view of Kim further in view of Canova and further in view of Goldberg (US Patent 5,351,038).

Regarding claim 12, Ramakrishnan, Kim and Canova disclose all of the claimed limitations except for the claimed output means provide a failure to trip indication in response to an arc fault or ground fault signal in the absence of a tripped indication from the trip sensor. Goldberg discloses *Quick Trip Circuit Breaker Locator* that includes an indicator that is used to indicate the failure of the circuit breaker to trip in the presence of a fault (claim 3). Adding an indicator to the device of Ramakrishnan, Kim and Canova to indicate to the user that the circuit breaker failed to trip would give the user a better understanding of the working of the device and would also help to troubleshoot the device. Therefore it would have been obvious to one of ordinary skill in the art at the

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time of the invention to modify the device disclosed by Ramakrishnan, Kim and Canova according to the teachings of Goldberg to include an indicator to indicate the failure of the circuit breaker to trip in response to a fault.

Regarding claim 14, the claim is interpreted and rejected as claim 12 stated above. It would have been obvious to one of ordinary skill in the art to make the indicator light flash or any other form of indication.

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramakrishnan in view of Kim further in view of Canova further in view of Goldberg and further in view of Lyke et al. (Lyke; US Patent 6,018,451).

Regarding claim 13, Ramakrishnan, Kim, Canova and Goldberg disclose all of the claimed limitations except for the claimed monitor comprising non-volatile memory retaining the thermal trip indication and the magnetic trip indication in the event of loss of power. Lyke discloses *Circuit Breaker Trip Unit And Method For Real-Time Fault Indication* that teaches using memory to store the history of the circuit breaker trip indications (claim 15). Adding memory to the device of Ramakrishnan, Kim, Canova and Goldberg would allow a user to keep track of faults that have occurred and also to be aware of multiple faults that occur over time in order to better understand a potential recurring problem. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device disclosed by Ramakrishnan, Kim,

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Canova and Goldberg according to the teachings of Lyke to include memory to store the trip indications.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fraisse, *Electronic Trip Device Whose Front Panel Is Formed By A Flat Screen Display*, US Patent 5,220,479;

Turner et al. *Trip Indicators For Circuit Protection Devices*, US Patent 5,847,913;

Spencer et al. *Circuit Breaker With Integrated Control Features*, US Patent 5,875,087;

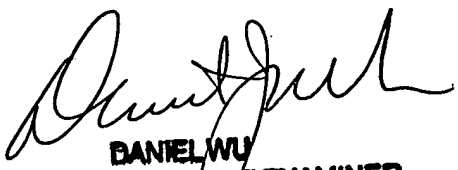
Hoffman, *Microprocessor Based Setting Group Controller For Protective Relay Operations*, US Patent 6,222,714.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Travis R. Hunnings whose telephone number is (571) 272-3118. The examiner can normally be reached on 8:00 am - 5:00 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel J. Wu can be reached on (571) 272-2964. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TRH


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8/21/05